DETERMINATION OF ATMOSPHERIC AND SURFACE PARAMETERS FROM SIMULATED AIRS/AMSU SOUNDING DATA: RETRIEVAL AND CLOUD CLEARING METHODOLOGY

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AIRS (Atmospheric Infrared Sounder) is a high spectral resolution ($\nu/\Delta\nu$ = 1200) infrared sounder, covering the spectral domain 650 cm^{-1} - 2676 cm^{-1}, which will fly on the EOS PM1 platform together with AMSU A (Advanced Microwave Sounding Unit A) and an AMSU B like instrument. The spectral and signal to noise characteristics of AIRS were designed so as to achieve RMS errors of 1°C and 15% with regard to temperature and layer precipitable water vapor in 1 km layers in the troposphere. Retrievals of such accuracy can be achieved under partial cloud cover with multiple cloud formation in up to 80% fractional cloud cover when AIRS is accompanied by AMSU A/B. New methodology has been developed, utilizing eigen-value decomposition of the channel signal to noise matrix, to optimize retrievals under clear and cloudy conditions. Results of simulation studies including multiple cloud formations will be presented. Particular attention will be paid to the effects of clouds on the channel noise covariance matrix, and the importance of including clouds in simulation studies when assessing instrumental signal to noise requirements.

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4. None

5. Oral

6. No

2. Inversion Problems in Earth and Planetary Remote Sensing

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